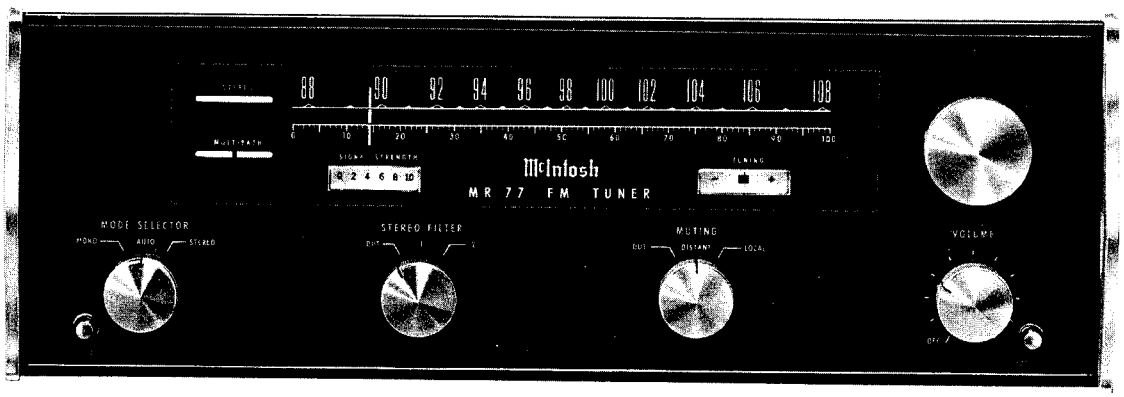
McIntosh

MR 77

FM TUNER



SERVICE INFORMATION

STARTING WITH SERIAL NO. 53Y82

McINTOSH LABORATORY INC. 2 CHAMBERS STREET BINGHAMTON, NEW YORK

MR 77

ELECTRICAL SPECIFICATIONS

SENSITIVITY

2μV for better than 35dB quieting. 2.5μV IHF usable sensitivity typical.

SIGNAL TO NOISE RATIO

Better than 75dB below 100% modulation.

HARMONIC DISTORTION

Less than 0.2% mono or stereo at 100% modulation 20Hz to 15kHz. Typically less than 0.05% at 1kHz.

FREQUENCY RESPONSE

± 1dB 20Hz to 15KHz with standard 75μS de-emphasis.

CAPTURE RATIO

Better than 2.5dB IHF.

SPURIOUS REJECTION

Greater than 100dB IHF.

IMAGE REJECTION

Greater than 100dB at 90MHz; greater than 90dB at 105MHz IHF.

STEREO SEPARATION

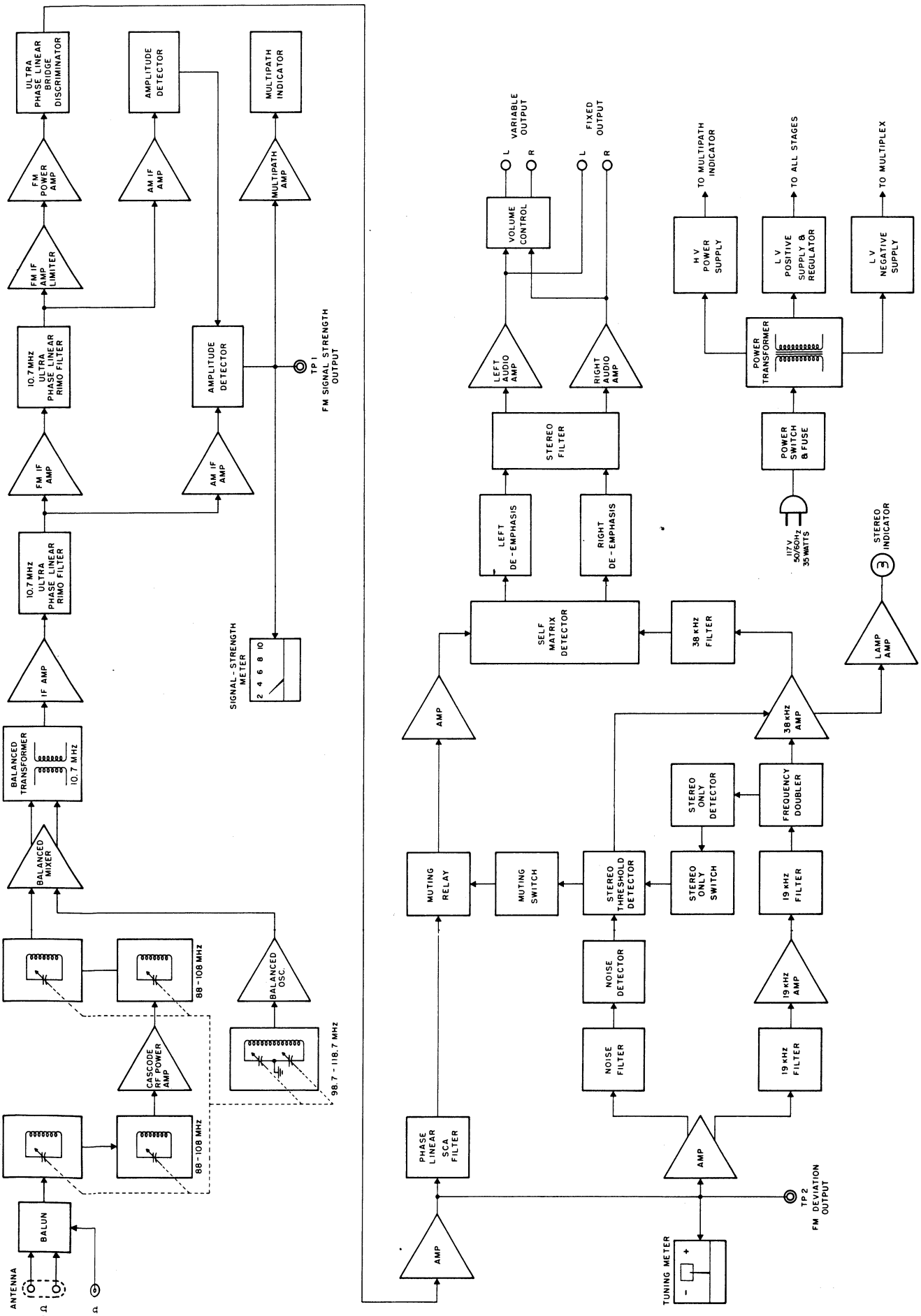
Better than 40dB at 1kHz.

SCA FILTER

50dB down from 67kHz to 74kHz; 275dB per octave slope.

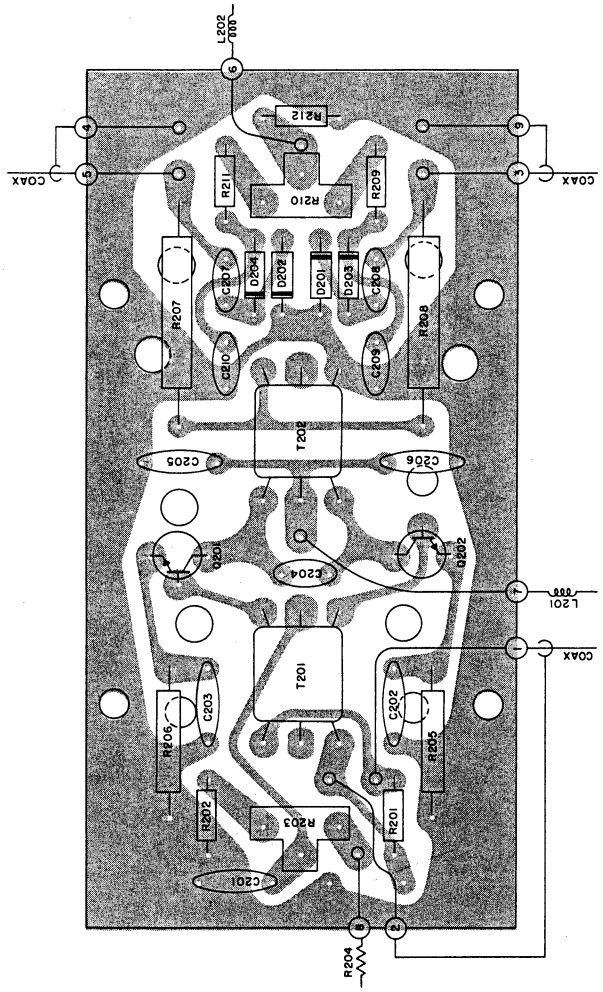
POWER REQUIREMENTS

117VAC, 50 - 60Hz, 35W.

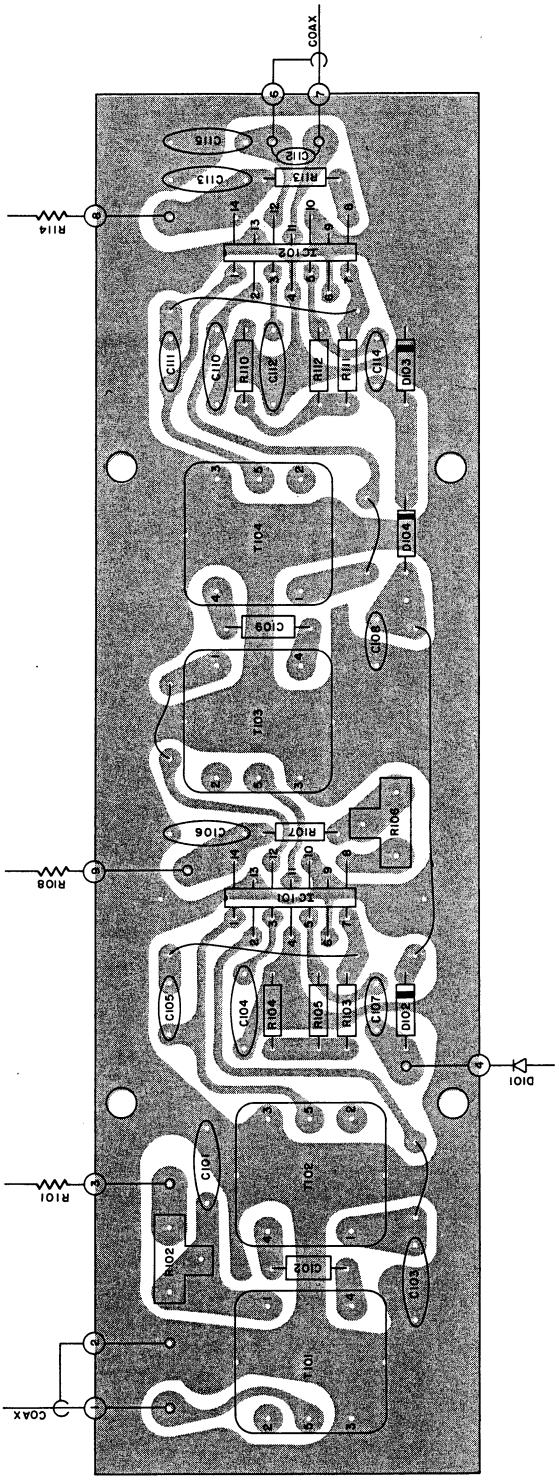


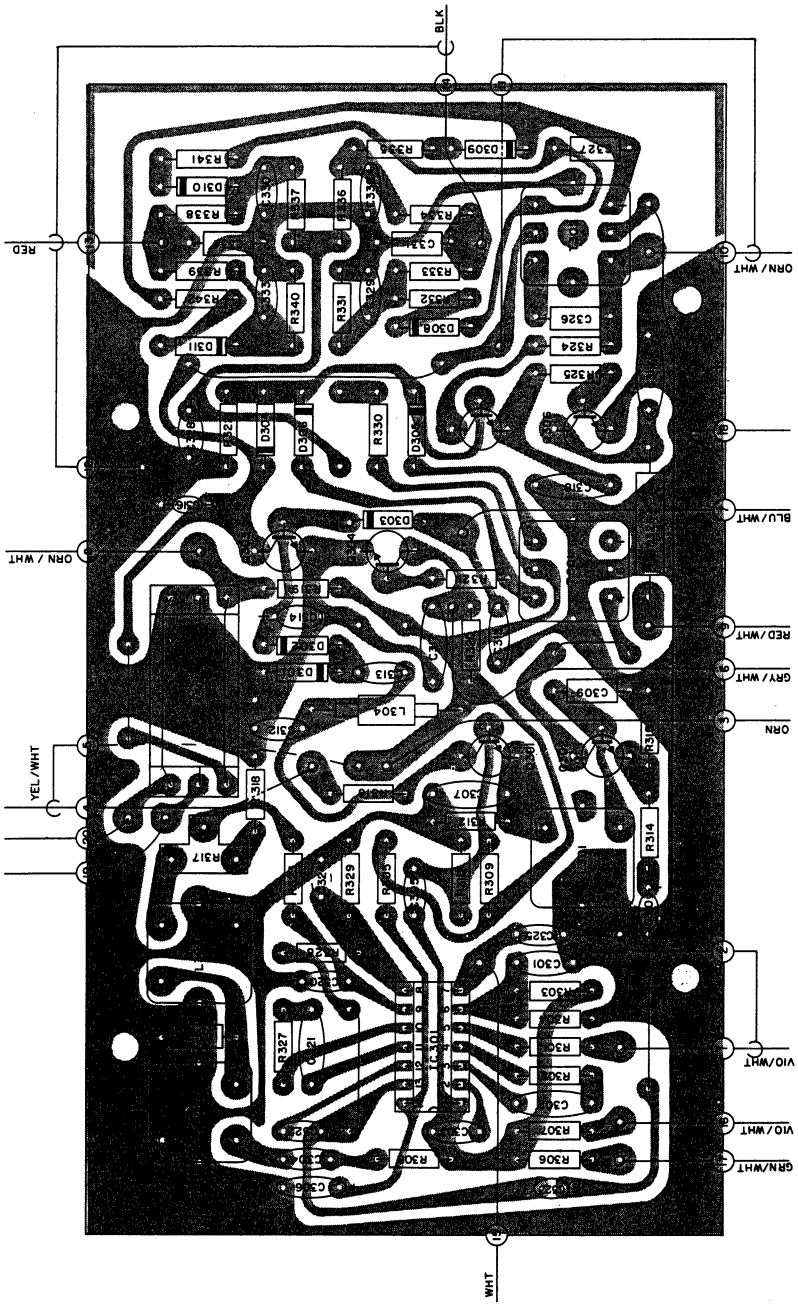
MR 77 BLOCK DIAGRAM

DETECTOR PRINTED CIRCUIT BOARD 044-116



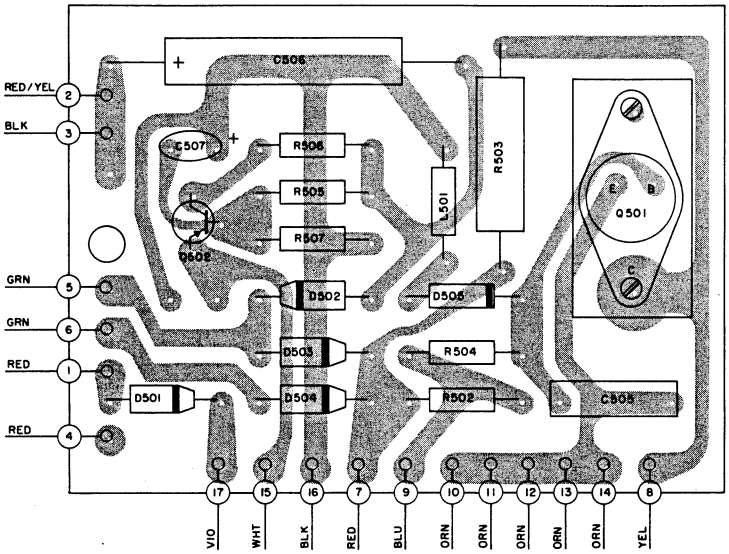
I.F. PRINTED CIRCUIT BOARD 044-117

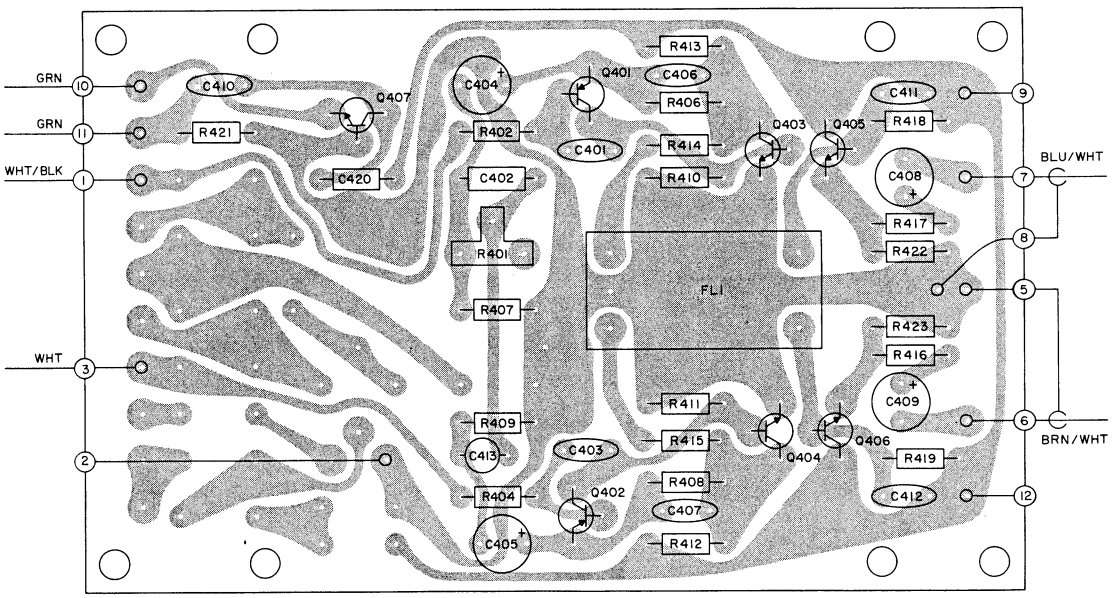




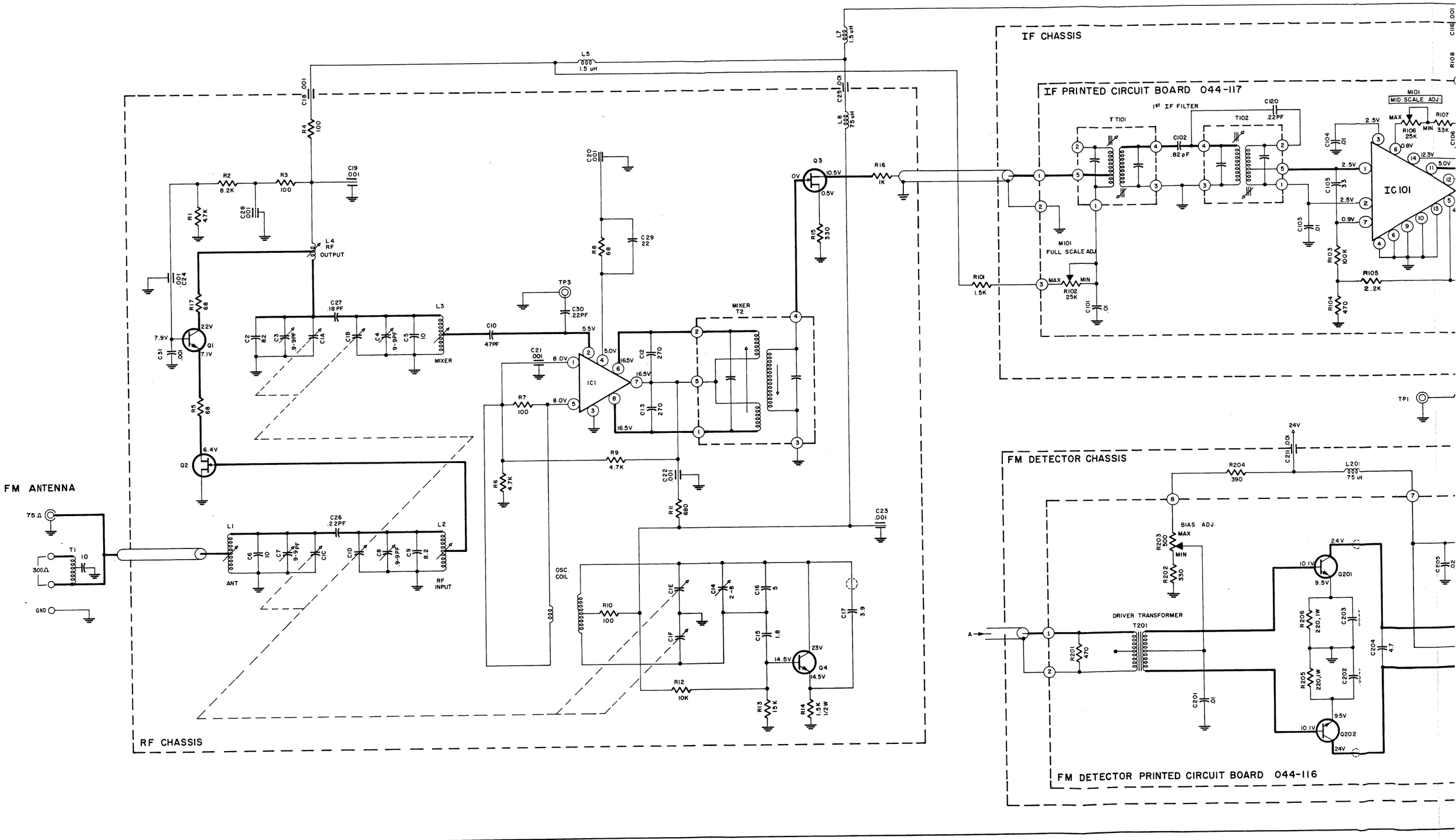
MPX PRINTED CIRCUIT BOARD 044-552

POWER SUPPLY PRINTED CIRCUIT BOARD 044-115





OUTPUT AMPLIFIER PRINTED CIRCUIT BOARD 044-793


FM ANTENNA
75Ω
T1
10
300Ω
GND
L1
L2
C26
.22PF
C6 10
C7 9-9PF
C10
C8 9-9PF
C9 8.2
ANT
RF INPUT
RF CHASSIS
L5
1.5 uH
C16 .001
R4 100
R2 8.2K
R3 100
C19 .001
R1 4.7K
C28 .001
L4
RF OUTPUT
C24
R17 68
22V
7.9V
Q1
7.1V
C31 .001
R5 68
6.4V
Q2
C27
.18PF
C2 82
C3 9-9PF
C1A
C18
C4 9-9PF
C5 10
MIXER
C10
47PF
TP3
C30
.22PF
5.5V
C20 .001
R8 68
C29 22
C21 .001
8.0V
IC1
5.0V
16.5V
C12 270
C13 270
R7 100
R9 4.7K
R6 4.7K
C22 .001
R11 680
C23 .001
OSC COIL
R10 100
C1E
C1F
C14 2-8
C16 5
C15 1.8
C17 3.9
23V
14.5V
Q4
R12 10K
R13 15K
R14 1.5K 1/2W
MIXER T2
L7 1.5 uH
C25 .001
L8 7.5 uH
Q3
0V
10.5V
0.5V
R16 1K
R15 330
R101 1.5K
C101 .01
M101 FULL SCALE ADJ
MAX
MIN
R102 25K
IF CHASSIS
IF PRINTED CIRCUIT BOARD 044-117
1st IF FILTER
T T101
T102
C102 .82 pF
C120 .22PF
C104 .01
C105 33
C103 .01
2.5V
0.9V
IC101
12.3V
5.0V
M101 MID SCALE ADJ.
R106 25K
0.8V
R107 3.3K
R103 100K
R104 470
R105 2.2K
C106 .001
R108
TP1
24V
C111 .001
FM DETECTOR CHASSIS
R204 390
L201 7.5 uH
BIAS ADJ.
R203 500
R202 330
10.1V
Q201
9.5V
Q202
DRIVER TRANSFORMER
T201
R201 470
R206 220,1W
R205 220,1W
C203
C202
C201 .01
C204 4.7
C205
FM DETECTOR PRINTED CIRCUIT BOARD 044-116

IF CHASSIS

IF PRINTED CIRCUIT BOARD 044-117

1st IF FILTER

2ND IF FILTER

IC 101

IC 102

MID SCALE ADJ.

FULL SCALE ADJ

MIXER T2

Q3

Q4

TO FM DETECTOR CHASSIS

TO OUTPUT AMP SECTION

TO MPX SECTION

SIGNAL STRENGTH

FM DETECTOR CHASSIS

DRIVER TRANSFORMER T201

OUTPUT TRANSF. T202

BIAS ADJ.

Q201

Q202

M301 ADJUST

T203 PHASE-LINEAR BRIDGE REACTANCES

FM DETECTOR PRINTED CIRCUIT BOARD 044-116

TUNER SECTION

MR 77 154-680

SCHEMATIC NOTES

1. Unless otherwise specified: Resistance values are in ohms, 1/4 watt, and 10% tolerance; capacitance values smaller than 1 are in microfarads (µF); capacitance values greater than 1 are in picofarads (pF); inductors are in microhenries (µH).
2. Printed circuit board components are outlined on the schematics by dotted lines. The circled numbers around the dotted lines correspond to the numbers on the PC Board layouts.
3. The heavy lines on the schematics denote the primary signal path.
4. The terminal numbering of rotary switches is for reference only.
5. All voltages indicated on the schematics are measured under the following conditions:
   a. Use of an 11 megohm input impedance VTVM.
   b. All voltages ±10% with respect to chassis ground.
   c. No signal at input or antenna terminals.
   d. AC input at 117 volts, 50/60 Hz.
   e. Front panel controls at:

Tuning indicator	100MHz (no signal)	Muting	Off
Volume	Fully CW	Mode	Auto
Stereo Filter	Out	Panel Lights	Bright

LAMP & METER REPLACEMENT

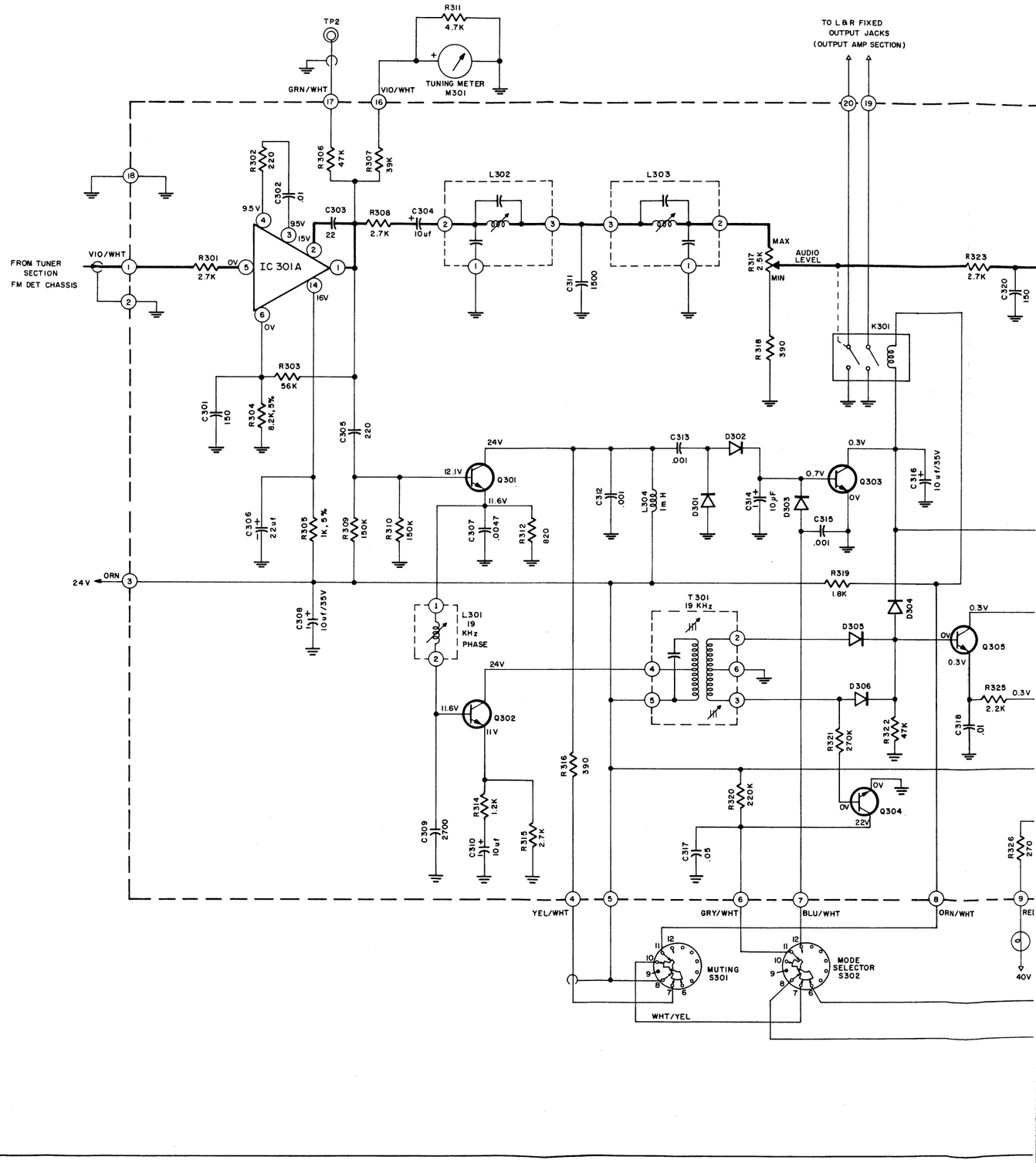
To Replace Panel Lights
1. Remove bottom cover.

To Replace Dial Panel Lights
1. Remove knobs & front panel.

To Replace Stereo Light
1. Remove dust cover.

To Replace Multipath Tube
1. Remove knobs & front panel.
2. Remove dial panel screws.
3. Tilt dial panel forward.
4. Slide out tube.

To Replace Meters
1. Remove knobs & front panel.
2. Remove dial panel screws.
3. Tilt forward dial panel sliding off pointer.
4. Loosen meter screws & remove.

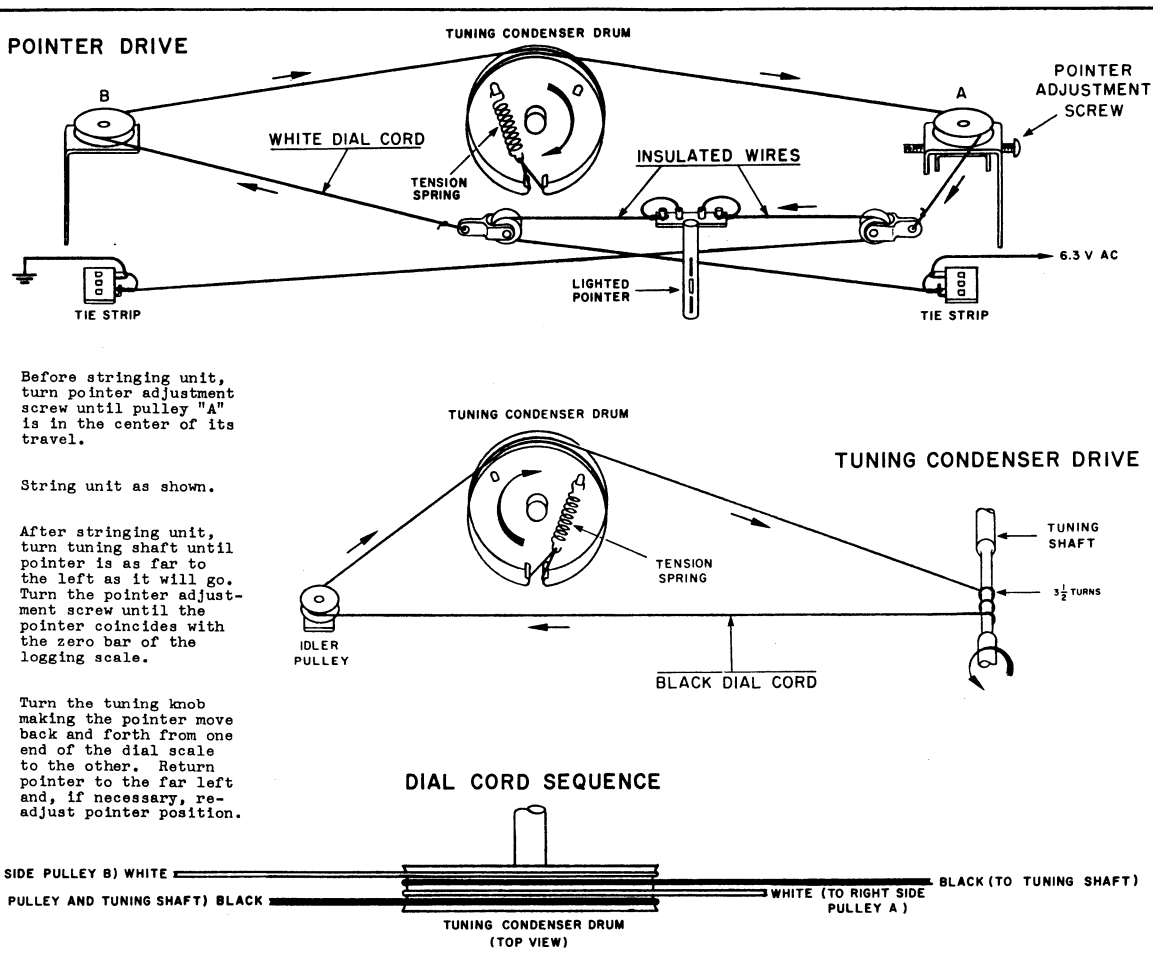


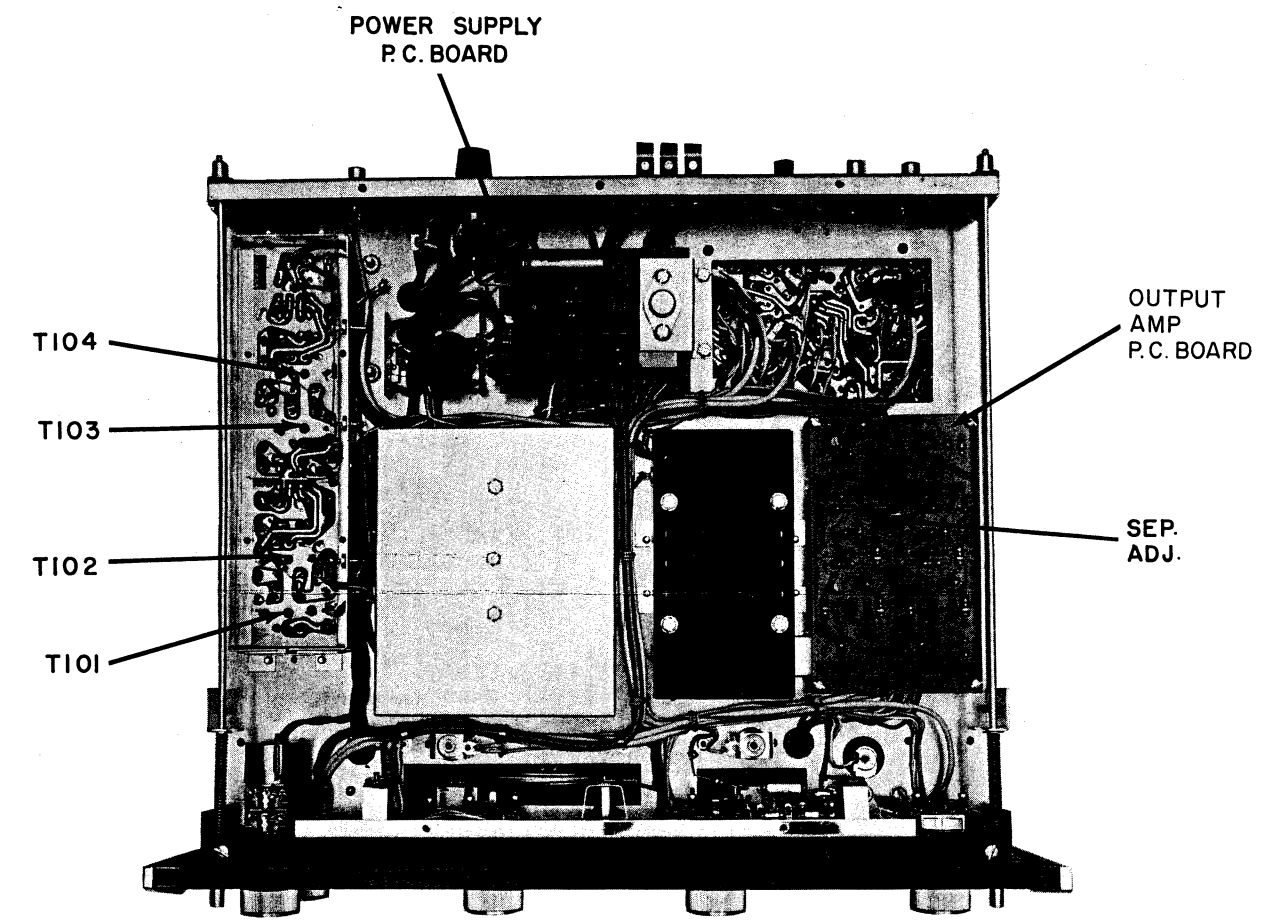
MPX PC BOARD 044-552

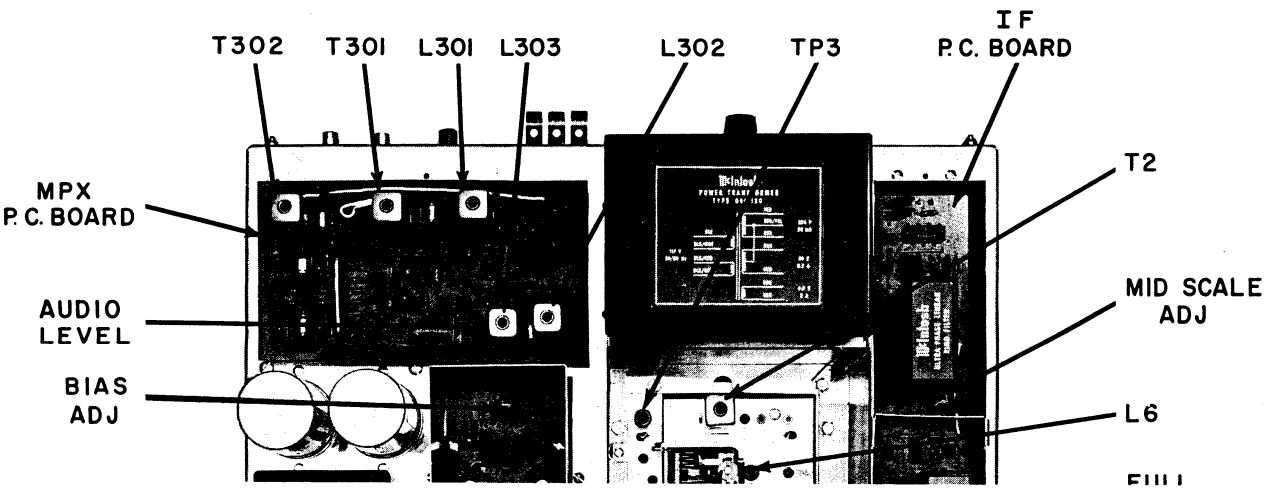
TP2
R311 4.7K
TUNING METER M301
GRN/WHT
VIO/WHT
TO L&R FIXED OUTPUT JACKS (OUTPUT AMP SECTION)
-12V
WHT
FROM TUNER SECTION FM DET CHASSIS
VIO/WHT
R301 2.7K
IC 301A
IC 301B
R302 220
C302 .01
R306 47K
R307 39K
C303 22
R308 2.7K
C304 10uf
L302
L303
C311 1500
R317 2.5K AUDIO LEVEL MAX MIN
R318 390
K301
R323 2.7K
C320 150
R327 220
C321 .01
C322 12
R328 22K
C323 1uF
R349 1K
C324 47
R329 22K
C325 22uf
R303 56K
C301 150
R304 8.2K,5%
C305 220
C313 .001
D302
D301
C314 10µF
D303
C315 .001
Q301
Q303
C316 10 uf/35V
C306 22uf
R305 1K, 5%
R309 150K
R310 150K
C307 .0047
R312 820
C312 .001
L304 1mH
R319 1.8K
D304
T301 19 KHz
L301 19 KHz PHASE
D305
D306
Q305
Q306
R324 4.7K
R325 2.2K
C318 .01
R321 270K
R322 47K
Q302
R316 390
R320 220K
Q304
C317 .05
R326 270
C319 0.1uf
R330 27K
C328 10 uf/35V
C309 2700
R314 1.2K
C310 10uf
R315 2.7K
T302 38 KHz
C326 4700
C327 4700
D308
D309
D310
D311
R332 1.5K
C329 .001
C330 .001
C332 .001
C333 .001
R331 150K
R333 33K
R334 33K
R335 1.5K
R336 150K
R337 150K
R338 33K
R339 33K
R340 150K
R341 1.5K
R342 1.5K
BLK
RED
ORN
24V
C308 10uf/35V
YEL/WHT
GRY/WHT
BLU/WHT
ORN/WHT
RED/WHT
ORN/WHT
MUTING S301
MODE SELECTOR S302
MPX LIGHT
40V
WHT/YEL
R348 2.2M
R343 2.2M
STEREO FILTER
C335 .0047
C336 .0027
C337 .0027
R345 47K
R346 47K
C338 .033
R347 47K
STEREO FILTER S303
R344 2.2M
LEFT OUTPUT
RIGHT OUTPUT TO OUTPUT AMP SECTION

MPX SECTION

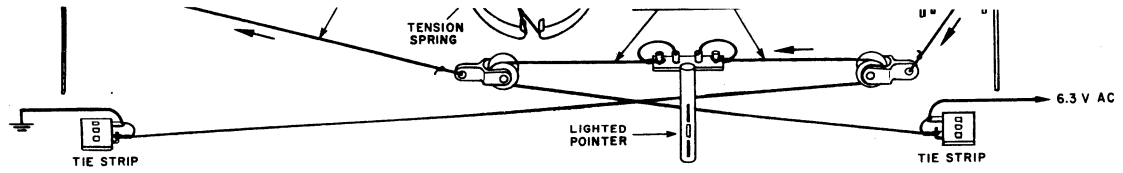
MR 77 154-683


POINTER DRIVE
TUNING CONDENSER DRUM
B
A
POINTER ADJUSTMENT SCREW
WHITE DIAL CORD
INSULATED WIRES
TENSION SPRING
6.3 V AC
LIGHTED POINTER
TIE STRIP
TIE STRIP
Step 1 Before stringing unit, turn pointer adjustment screw until pulley "A" is in the center of its travel.
Step 2 String unit as shown.
Step 3 After stringing unit, turn tuning shaft until pointer is as far to the left as it will go. Turn the pointer adjustment screw until the pointer coincides with the zero bar of the logging scale.
Step 4 Turn the tuning knob making the pointer move back and forth from one end of the dial scale to the other. Return pointer to the far left and, if necessary, re-adjust pointer position.
TUNING CONDENSER DRUM
TUNING CONDENSER DRIVE
TUNING SHAFT
3 1/2 TURNS
TENSION SPRING
IDLER PULLEY
BLACK DIAL CORD
DIAL CORD SEQUENCE
(TO LEFT SIDE PULLEY B) WHITE
(TO IDLER PULLEY AND TUNING SHAFT) BLACK
WHITE (TO RIGHT SIDE PULLEY A)
BLACK (TO TUNING SHAFT)
TUNING CONDENSER DRUM (TOP VIEW)
POINTER DIAL STRINGING


POWER SUPPLY P. C. BOARD
T104
T103
T102
T101
OUTPUT AMP P. C. BOARD
SEP. ADJ.


T302
T301
L301
L303
L302
TP3
IF P. C. BOARD
MPX P. C. BOARD
AUDIO LEVEL
BIAS ADJ
T2
MID SCALE ADJ
L6

MR 77



Step 1 Before stringing unit, turn pointer adjustment screw until pulley "A" is in the center of its travel.

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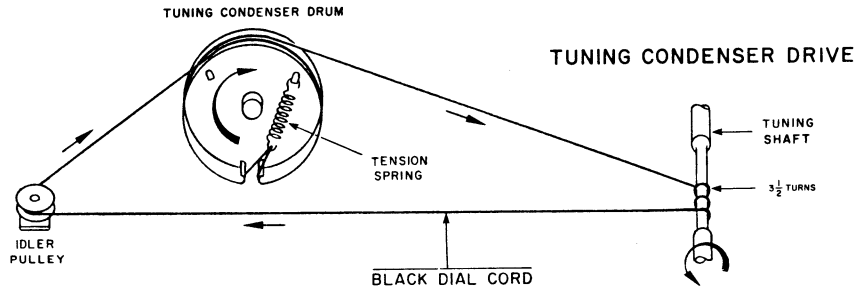
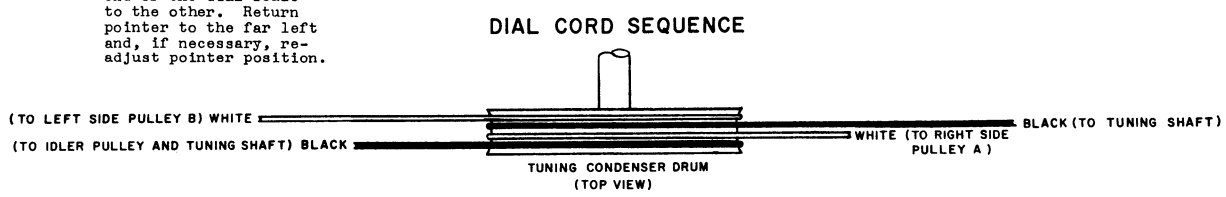
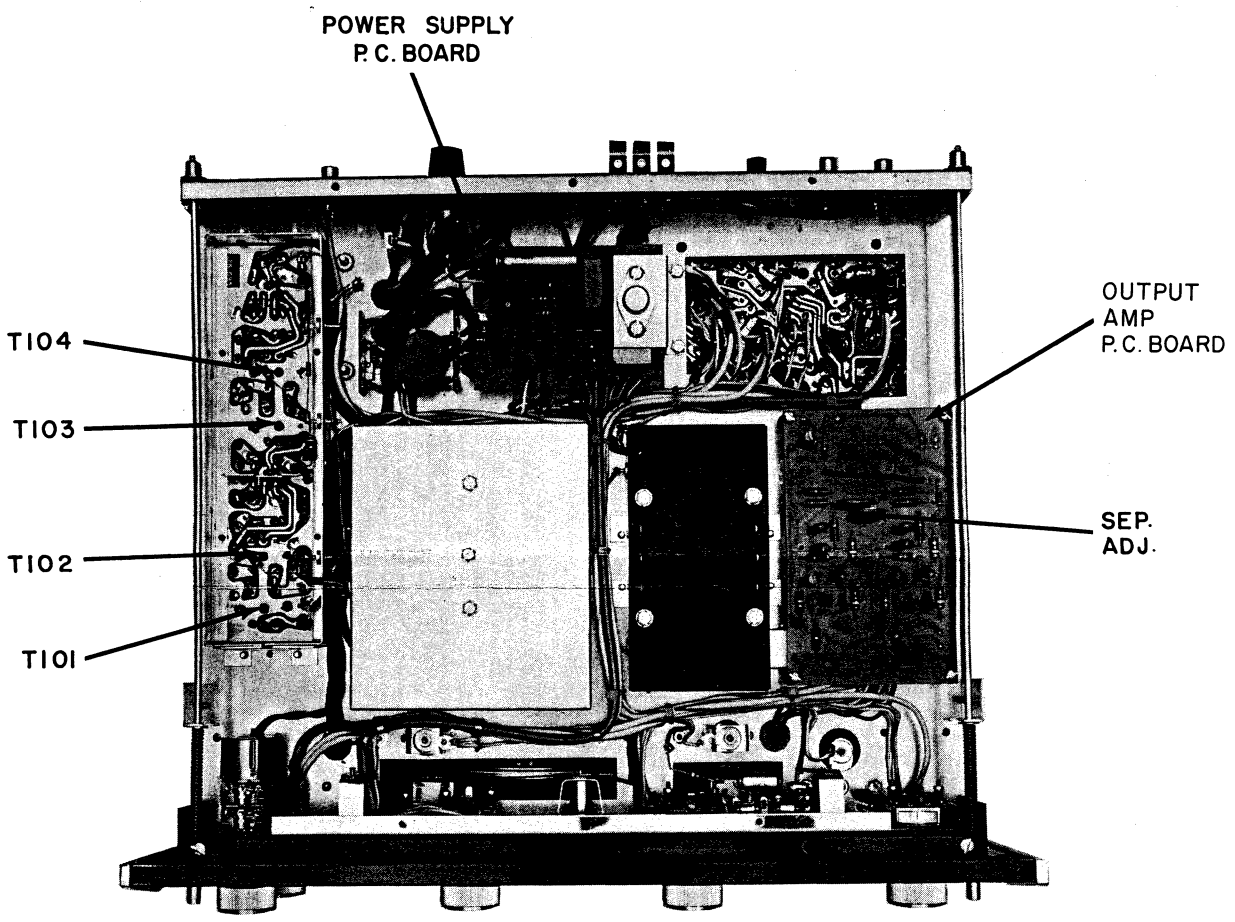
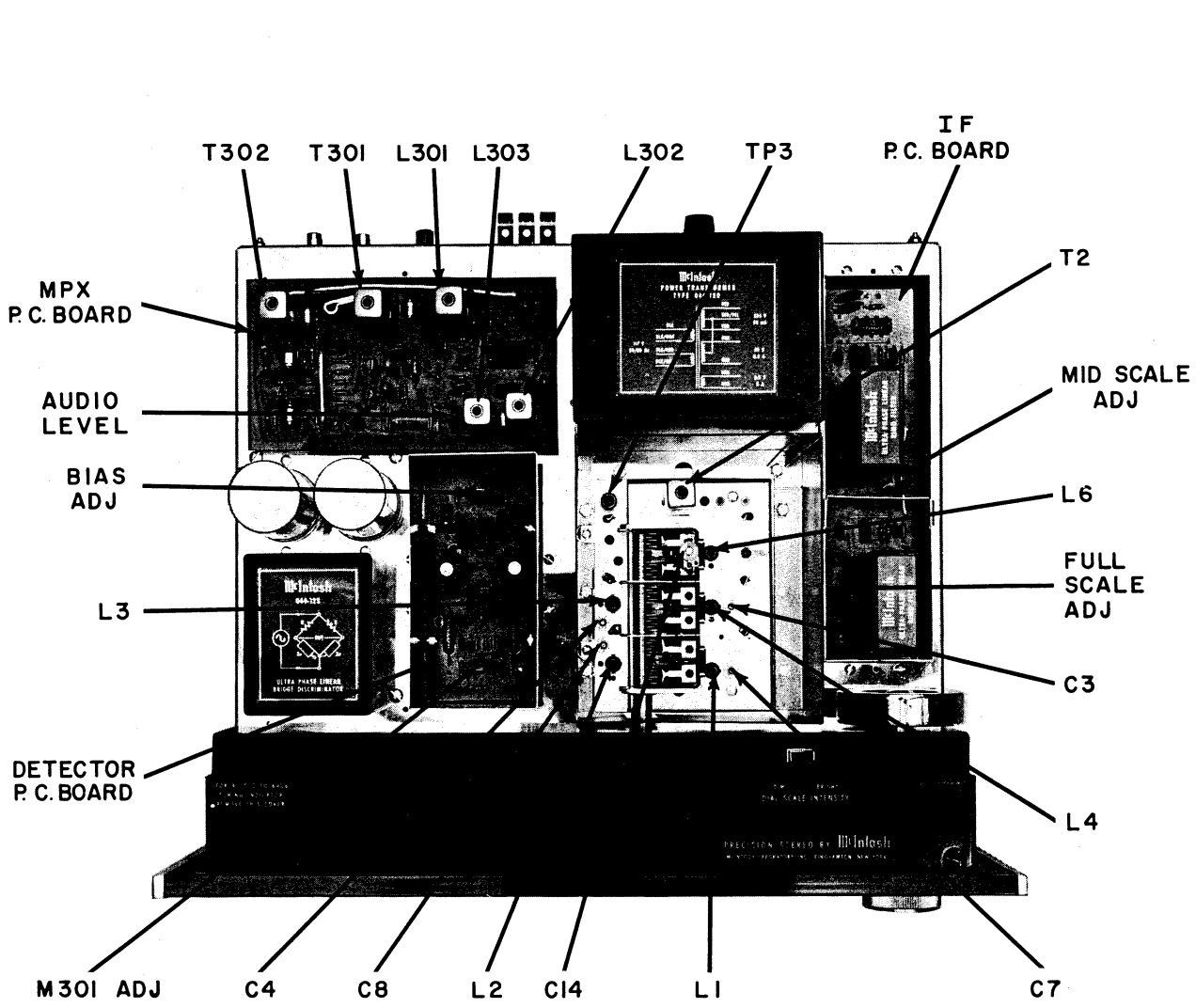


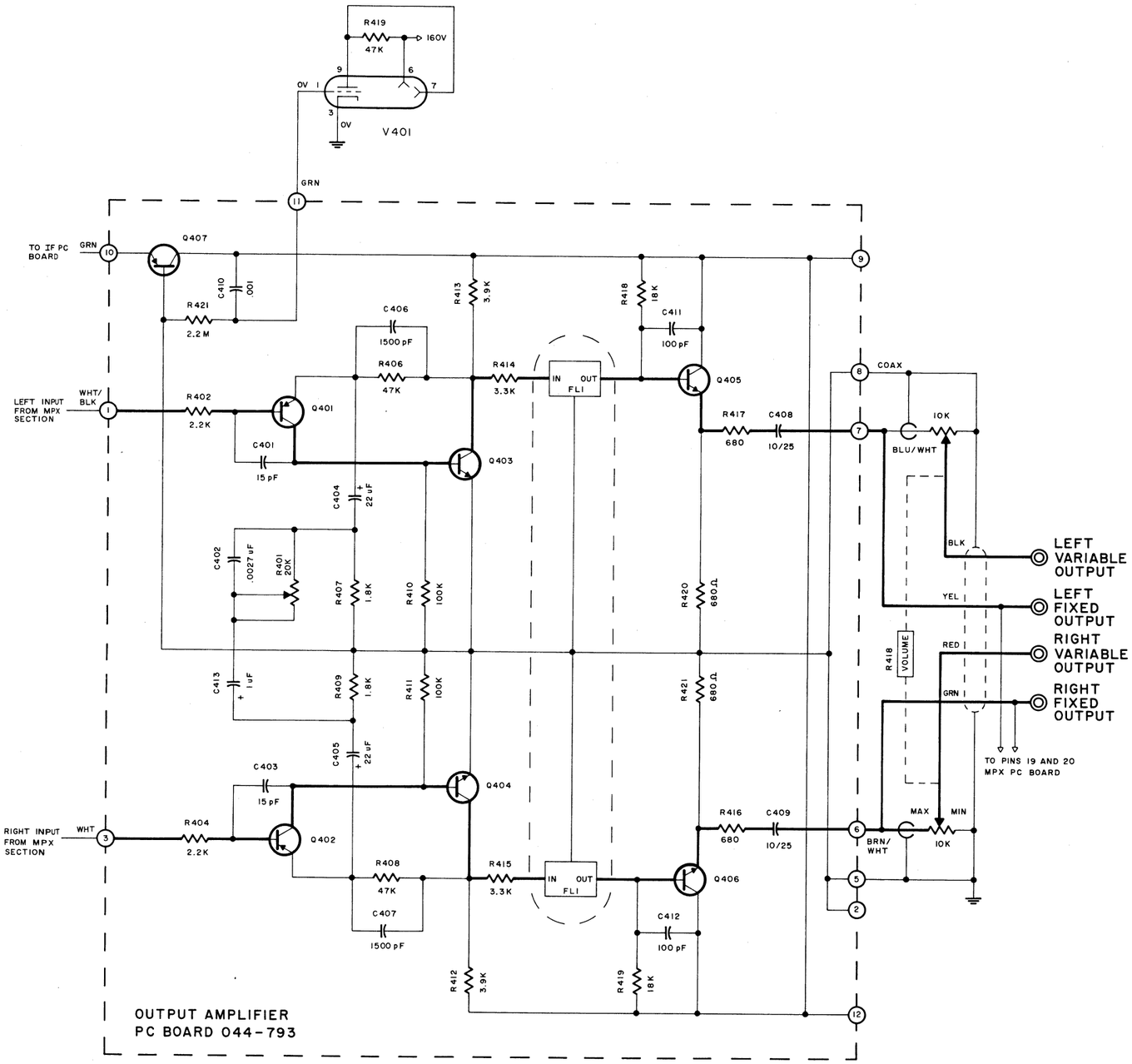

DIAL CORD SEQUENCE
(TO LEFT SIDE PULLEY B) WHITE
(TO IDLER PULLEY AND TUNING SHAFT) BLACK
BLACK (TO TUNING SHAFT)
WHITE (TO RIGHT SIDE PULLEY A)
TUNING CONDENSER DRUM
(TOP VIEW)

POINTER DIAL STRINGING





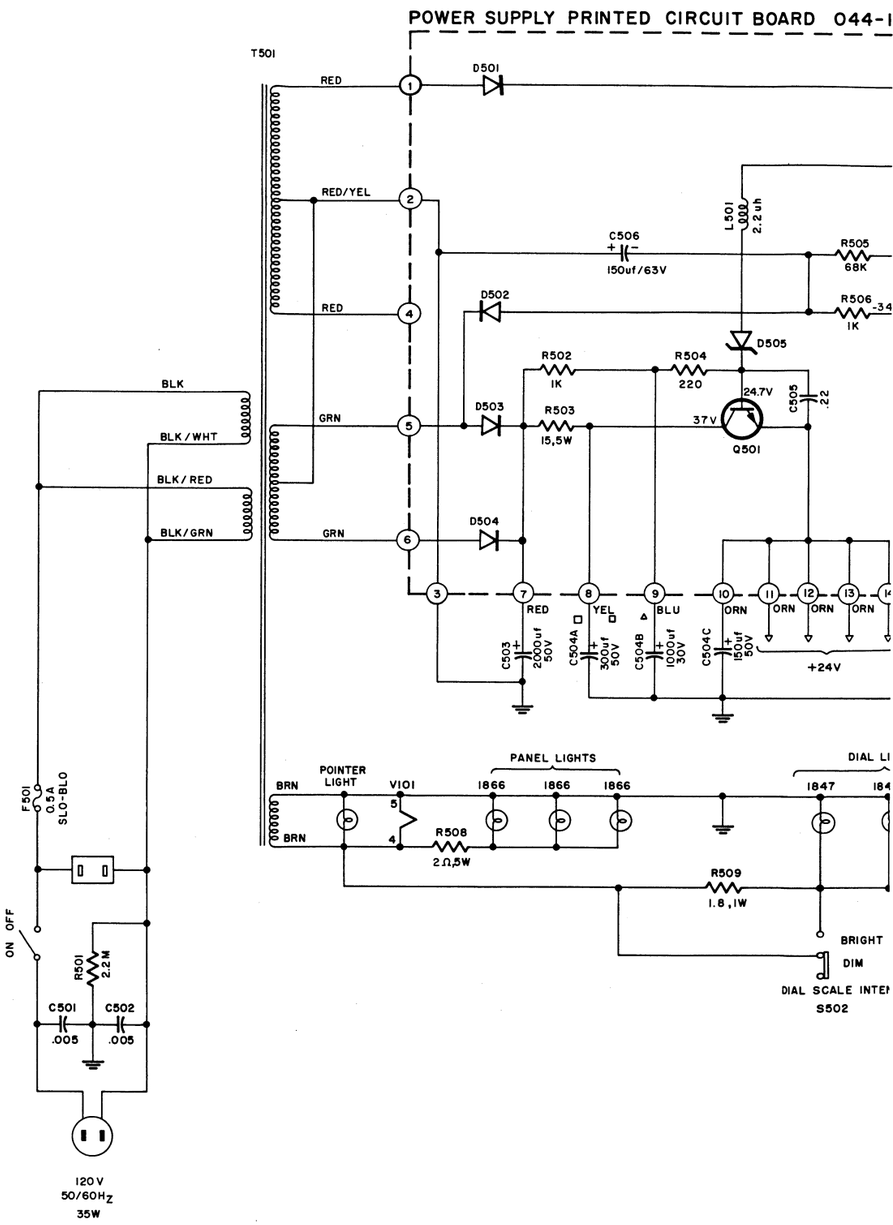
MR 77 MR 77

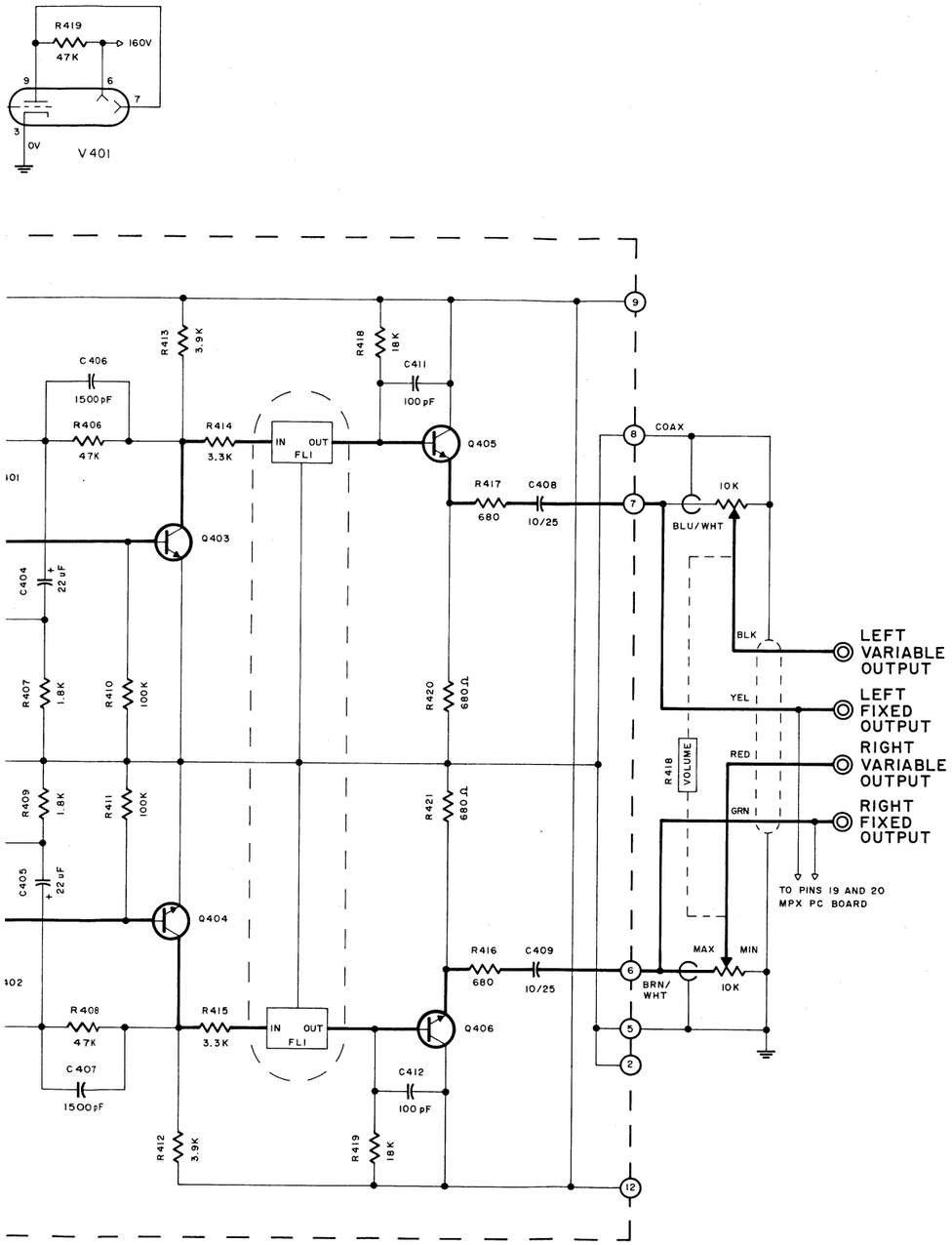


OUTPUT AMPLIFIER SECTION

MR 77

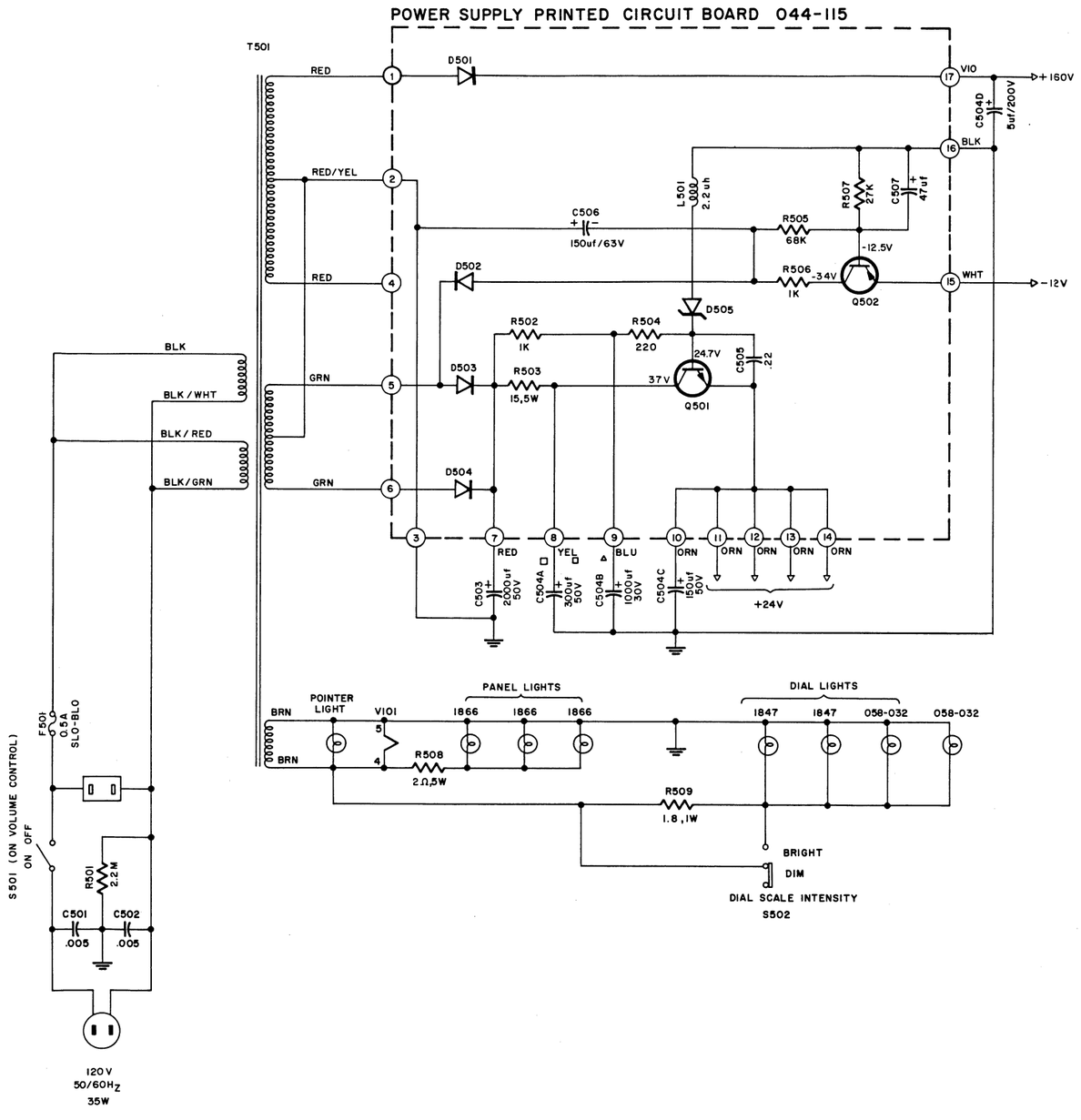
154-684





OUTPUT AMPLIFIER SECTION

MR 77 154-684



POWER SUPPLY SECTION

MR 77 154-679

MR77 ALIGNMENT INSTRUCTIONS

All McIntosh tuners are carefully aligned and tested at the factory using the finest available test equipment. All McIntosh tuners will meet their published specifications when shipped from the factory.

After extensive operation, or servicing, it may be desirable to realign the tuner circuits for best performance. The charts below give complete information on the circuit realignment procedure for the MR77.

The test equipment listed (or its equivalent) is necessary to properly align an MR77. The accuracy of the alignment will be directly related to the accuracy and calibration of the test equipment used.

If the necessary test equipment is not available, alignment should not be attempted. For additional information, contact Customer Service Department, McIntosh Laboratory, Inc., 2 Chambers Street, Binghamton, New York 13903 (telephone 607-723-3512).

Alignment should be done in the following order: FM-MPX

TEST EQUIPMENT REQUIRED

1. FM Signal Generator (Measurement 188 or Sound Technology 1000A)
2. VTVM (RCA WV96C)
3. Multiplex Generator (Radiometer SMG1) or Sound Technology 1000A.
4. 10.7 MHz FM sweep generator (Kay 385 or equivalent). (Not needed if Measurement 275 IF converter is available.)
5. 10.7 MHz Generator (preferably crystal controlled)
6. Oscilloscope (Hewlett-Packard 120B or equivalent)
7. Harmonic Distortion Analyzer (Hewlett-Packard 333A or equivalent)
8. 10.7 MHz ±75 kHz sweep marker generator.

FM ALIGNMENT

STEP	TUNER DIAL SETTING	SIGNAL GENERATOR			INDICATOR		ADJUST	TEST LIMITS	REMARKS
		FREQ.	COUPLING	MODULATION	TYPE	CONNECTED TO			
1	Point of no interference	10.7 MHz	TO TP-3	FM ±200 kHz sweep @ 60 Hz rate	Oscilloscope	TP 1	Top (primary) and bottom (secondary) of T2	Maximum height of 10.7 MH_z marker and best symmetry of 10.7 MH_z ±75kHz markers.	Keep signal generator output low to prevent limiting. TP 1 voltage should not exceed 0.5 volts. Rimo filters do not have a flat-topped response. See typical response curve (Fig. 2). If proper response cannot be obtained go to Step 2. Otherwise go to Step 3. Bottom covers must be on front end and discriminator chassis. Regeneration will distort sweep if either cover is removed.
2	Same	Same	Same	Same	Same	Same	Use standard insulated hex tool. Top and bottom cores of Rimo filters accesable thru bottom of circuit board.	Same	Carefully peak each core for maximum gain at 10.7 MHz (center of IF bandpass), and then touch up all cores for best symmetry to obtain bandpass on opposite page. Do not stagger tune.
3	Same	Same	Same	CW	VTVM	TP 2	M301 adjust R210	Zero DC at TP 2	With tuner horizontal and right side up, M301 should be centered. 10.7 MHz frequency must be precise for this adjustment.
4		Same	Same	FM ±75 kHz @ 60 Hz rate	Oscilloscope	Fixed audio output jacks	Bias pot R203	Maximum audio output	If output is clipped, reduce audio output by adjusting R317; muting off, stereo filter out.
5	106MHz	106MHz	300Ω antenna terminals thru matching network or balun	400Hz; 75kHz deviation (Fig. 1)	VTVM to TP 1 and scope to L or R audio output		Oscillator trimmer C14	Maximum negative voltage at TP 1	Keep TP 1 voltage below one volt. Observe signal on scope for reference.
6	90 MHz	90 MHz	Same	Same	Same		Oscillator Coil L6	Same	Same. Repeat Steps 5 and 6 until dial is accurate.
7	104 MHz	104 MHz	Same	Same	Same		Adjust C3, C4, and C9	Same	Keep TP 1 voltage below one volt. Reduce signal input as circuits align.
8	92 MHz	92 MHz	Same	Same	Same		L2, L3, L4	Same	Same
9	104 MHz	104 MHz	Same	Same	Harmonic distortion analyzer to L or R output		C7	Adjust for minimum noise and distortion at 2.5µV input	Noise and distortion should be more than 30dB down. Noise with no modulation should be more than 40dB down. Touch up C3, C4, and C9 if necessary.
10	92 MHz	92 MHz	Same	Same	Same		L1	Same	Touch up L2, L3, and L4 only if necessary.
11	Repeat Steps 9 and 10 until no further improvement is possible. Always adjust for minimum noise and distortion.								
12	92 MHz	92 MHz	Same	1 kHz at ±75 kHz deviation or Sound Technology dual sweep	Harmonic distortion analyzer to L or R output or Sound Technology to L or R output		R203	Minimum distortion should be less than 0.2%	A very low distortion FM generator is necessary. Sound Technology 1000A is recommended. Typical MR77 distortion is 0.05% in this test. Minimum distortion should correspond closely to maximum audio output. If Sound Technology 1000A is used, adjust R203 for smoothest horizontal dual-sweep pattern. Refer to Sound Technology manual. Check 1kHz harmonic distortion.
13	Same	Same	Same	1 kHz at ±75 kHz deviation	Oscilloscope connected to L or R output		R210	Reduce signal strength until noise appears on tips of signal. If necessary, adjust R210 so that tuning meter is centered.	
14	Same	Same	Same	Same	With muting in distant position, tuner should mute at approximately 5µV in 300Ω. With muting in local position, tuner should mute at approximately 20µV in 300Ω. Muting thresholds are fixed. These values are typical.				

MULTIPLEX DECODER ALIGNMENT

STEP	TUNER DIAL SETTING	SIGNAL GENERATOR			INDICATOR		ADJUST	TEST LIMITS	REMARKS
		FREQ.	COUPLING	MODULATION	TYPE	CONNECTED TO			
1	100 MHz or point of no interference	Same as tuner dial	300Ω antenna terminals with approximately 1000µV signal thru matching network	Mono (R = L) 1 kHz 100% modulation	Oscilloscope and AC-VTVM connected to either fixed audio output jack.		R317	2.5V RMS at fixed output jacks	Make sure tuning meter is at zero center. Maximum indication on signal strength meter and center indication on tuning meter should coincide.

2							hex tool. Top and bottom cores of Rimo filters accesable thru bottom of circuit board.		MHz (center of IF bandpass), and then touch up all cores for best symmetry to obtain bandpass on opposite page. Do not stagger tune.
3	Same	Same	Same	CW	VTVM	TP 2	M301 adjust R210	Zero DC at TP 2	With tuner horizontal and right side up, M301 should be centered. 10.7 MHz frequency must be precise for this adjustment.
4		Same	Same	FM ±75 kHz @ 60 Hz rate	Oscilloscope	Fixed audio output jacks	Bias pot R203	Maximum audio output	If output is clipped, reduce audio output by adjusting R317; muting off, stereo filter out.
5	106MHz	106MHz	300Ω antenna terminals thru matching network or balun	400Hz; 75kHz deviation (Fig. 1)	VTVM to TP 1 and scope to L or R audio output		Oscillator trimmer C14	Maximum negative voltage at TP 1	Keep TP 1 voltage below one volt. Observe signal on scope for reference.
6	90 MHz	90 MHz	Same	Same	Same		Oscillator Coil L6	Same	Same. Repeat Steps 5 and 6 until dial is accurate.
7	104 MHz	104 MHz	Same	Same	Same		Adjust C3, C4, and C9	Same	Keep TP 1 voltage below one volt. Reduce signal input as circuits align.
8	92 MHz	92 MHz	Same	Same	Same		L2, L3, L4	Same	Same
9	104 MHz	104 MHz	Same	Same	Harmonic distortion analyzer to L or R output		C7	Adjust for minimum noise and distortion at 2.5µV input	Noise and distortion should be more than 30dB down. Noise with no modulation should be more than 40dB down. Touch up C3, C4, and C9 if necessary.
10	92 MHz	92 MHz	Same	Same	Same		L1	Same	Touch up L2, L3, and L4 only if necessary.
11	Repeat Steps 9 and 10 until no further improvement is possible. Always adjust for minimum noise and distortion.								
12	92 MHz	92 MHz	Same	1 kHz at ±75 kHz deviation or Sound Technology dual sweep	Harmonic distortion analyzer to L or R output or Sound Technology to L or R output		R203	Minimum distortion should be less than 0.2%	A very low distortion FM generator is necessary. Sound Technology 1000A is recommended. Typical MR77 distortion is 0.05% in this test. Minimum distortion should correspond closely to maximum audio output. If Sound Technology 1000A is used, adjust R203 for smoothest horizontal dual-sweep pattern. Refer to Sound Technology manual. Check 1kHz harmonic distortion.
13	Same	Same	Same	1 kHz at ±75 kHz deviation	Oscilloscope connected to L or R output		R210	Reduce signal strength until noise appears on tips of signal. If necessary, adjust R210 so that tuning meter is centered.	
14	Same	Same	Same	Same	With muting in distant position, tuner should mute at approximately 5µV in 300Ω. With muting in local position, tuner should mute at approximately 20µV in 300Ω. Muting thresholds are fixed. These values are typical.				

MULTIPLEX DECODER ALIGNMENT

STEP	TUNER DIAL SETTING	SIGNAL GENERATOR			INDICATOR		ADJUST	TEST LIMITS	REMARKS
		FREQ.	COUPLING	MODULATION	TYPE	CONNECTED TO			
1	100 MHz or point of no interference	Same as tuner dial	300Ω antenna terminals with approximately 1000µV signal thru matching network or balun	Mono (R = L) 1 kHz 100% modulation	Oscilloscope and AC-VTVM connected to either fixed audio output jack.		R317	2.5V RMS at fixed output jacks	Make sure tuning meter is at zero center. Maximum indication on signal strength meter and center indication on tuning meter should coincide.
2	Same	Same	Same	67kHz and 53kHz at ±75kHz deviation	Oscilloscope	Pin 13 of I_C on stereo decoder board	L302 and L303	Adjust L302 for maximum 53kHz, L303 for minimum 67kHz. Do not attempt to detect 67kHz at tuner output jacks. Ground scope probe close to multiplex board. Repeat adjustments of L302 and L303 until optimum condition is reached.	
3	Same	Same	Same	19 kHz pilot	Oscilloscope	Base of Q305	L301 and T301	For maximum amplitude	Decrease pilot level, if necessary, so that 19 kHz circuits do not limit or saturate.
4	Same	Same	Same	Same	Oscilloscope	T302 Pin 1 or 2	T302 top and bottom	Maximum amplitude	Use normal (9%) pilot level. Remove scope probe before going to Step 5.
5	Same	Same	Same	Stereo 1 kHz (100% modulation) left only pilot level normal and on	AC-VTVM	Right fixed output jack	T302 bottom (sec) and R4	40dB separation or more	First set R401 to maximum resistance. (Fully clockwise looking from front of tuner.) Adjust T302 bottom tuning slug (sec) for minimum output on right (undesired) channel. Then adjust R401 for maximum separation. Repeat the adjustment of T302 bottom and R401 until maximum separation is obtained. Then reverse channels and measure left channel separation.
6	Same	Same	Same	Stereo pilot carrier modulation only	AC-VTVM	L or R output jack		Less than 50MV of residual	With modulation off but pilot on. (NOTE: Stereo generator must have low spurious output.)

FIG. 1 ANTENNA MATCHING NETWORK

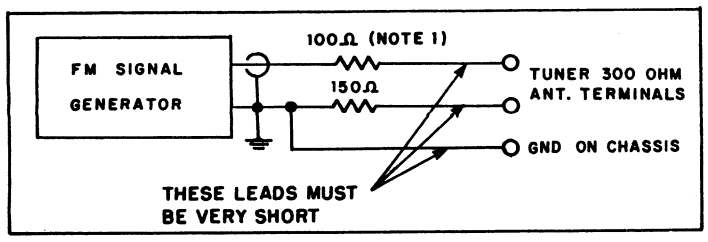
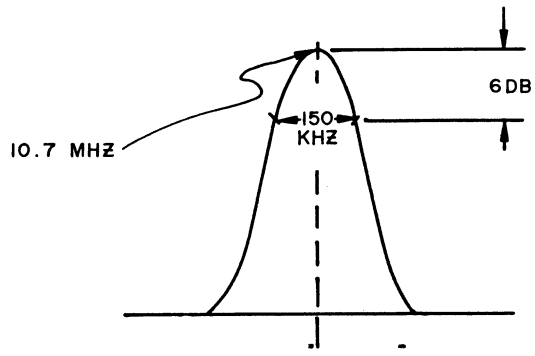


FIG. 2 TYPICAL IF RESPONSE CURVE



REPLACEMENT PARTS

All parts not listed are common items obtainable from radio parts jobbers.

Replacement parts may be obtained when ordered by PART NUMBER from:

McIntosh Laboratory, Inc.
Customer Service Department
2 Chambers Street
Binghamton, New York 13903
(telephone 607-723-3512)

CAPACITORS

Symbol Number	Description			Part Number
C12,13	Silver Mica	270pF	20V	063-010
C304	Tant. Elect.	10µF	35V	066-239
C306	Elect.	22µF	25V	066-240
C308	Tant. Elect.	10µF	35V	066-239
C309	Polystyrene	2700pF		064-239
C310	Tant. Elect.	10µF	35V	066-149
C311	Polystyrene	1500pF		064-092
C314	Tant. Elect.	10µF	35V	066-239
C316	Tant. Elect.	10µF	35V	066-239
C323	Elect.	1µF	50V	066-242
C325	Elect.	22µF	25V	066-240
C326,327	Polystyrene	4700pF		064-091
C328	Tant. Elect.	10µF	35V	066-239
C331	Polystyrene	.0033µF		064-090
C334	Polystyrene	.0033µF		064-090
C335	Polystyrene	4700pF		064-091
C336,337	Polystyrene	2700pF		064-093
C338	Polystyrene	.033µF		064-089
C404,405	Elect.	22µF	25V	066-240
C408,409	Tant. Elect.	10µF	35V	066-239
C503	Elect.	200µF	50V	066-154
C504	Elect.	5/300/150/1000 200/50/50/30		066-155
C505	Mylar	.22µF	250V	064-068
C506	Elect.	150pF	63V	066-205
C507	Elect.	47µF	16V	066-182

DIODES

D101,102	Ge. signal diode	070-003
D103,104	Ge. signal diode	070-003
D201,202	Si. signal diode	070-022
D203,204	Si. signal diode	070-047
D301,302	Si. signal diode	070-047
D303,304	Si. signal diode	070-047
D305,306	Si. signal diode	070-047
D308	Si. signal diode	070-047
D309,310	Si. signal diode	070-047
D311	Si. signal diode	070-047
D501,502	Si. rectifier diode	070-031
D503,504	Si. rectifier diode	070-031
D505	Zener diode 24V	070-065

CHOKES

L1	Antenna coil	122-087
L2	RF coil: input	122-088
L3	Mixer coil	122-090
L4	RF coil: output	122-089
L5	Choke 1.5µH	122-032
L6	Oscillator coil	122-117
L7	Choke 1.5µH	122-032
L8	Choke 75µH	122-013
L201,202	Choke 75µH	122-013
L301	Filter coil (19kHz)	122-094
L302,303	Filter coil (SCA)	122-093
L304	Choke 1MH	122-092
L501	Choke 2.2µH	122-001

TRANSISTORS

Q1	Si. NPN transistor	132-066
Q2	Si. Junction F.E.T.	132-097
Q3	Si. Junction F.E.T.	132-068
Q4	Si. NPN transistor	132-087
Q201,202	Si. NPN transistor	132-066
Q301	Si. NPN transistor	132-092
Q302	Si. NPN transistor	132-094
Q303	Si. NPN transistor	132-092
Q304	Si. NPN transistor	132-094
Q305	Si. NPN transistor	132-094
Q306	Si. NPN transistor	132-042
Q401,402	Si. PNP transistor	132-096
Q403,404	Si. NPN transistor	132-093
Q405,406	Si. NPN transistor	132-052
Q407	Si. NPN transistor	132-054
Q501	Si. NPN transistor	132-065
Q502	Si. PNP transistor	132-094

FUSES

F501	Fuse .5A slo-blo	089-020

POTENTIOMETERS

R102	Full scale adj.	134-260
R106	Mid scale adj.	134-260
R203	Bias adj.	134-265
R210	M301 adj.	134-265
R317	Audio level	134-258
R401	Separation adj.	134-260
R418	Volume control	134-217

RESISTORS

R205,206	Wirewound	220Ω	5%	1W	139-076
R207,208	Film	56.2Ω	1%	1W	144-014
R333,334	Film	33k	1%	1W	144-015
R338,339	Film	33k	1%	1W	144-015
R503	Wirewound	15Ω	10%	5W	139-041
R508	Wirewound	2Ω	10%	5W	139-005
R509	Wirewound	1.8Ω	10%	1W	139-077

SWITCHES

S301	Mode selector	146-138
S302	Muting switch	146-138
S303	Stereo filter	146-137
S502	Dial scale intensity	148-023

TRANSFORMERS

T1	Balun	043-226
T2	Mixer	162-051
T101	1st IF filter	162-053
T102	1st IF filter	162-052
T103	2nd IF filter	162-053
T104	2nd IF filter	162-052
T201	Driver transformer	044-121
T202	Output transformer	044-121
T203	FM detector	044-123
T301	RF transformer (19 kHz)	162-055
T302	RF transformer (38 kHz)	162-054
T501	Power transformer	044-120

TUBES

V401	6HU6	165-025

INTEGRATED CIRCUITS

IC1	Integrated circuit	133-005
IC101,102	Integrated circuit	133-002
IC301A,B	Integrated circuit	133-004

METERS

M101	Signal strength meter	124-005
M301	Tuning meter	124-006

MR 77 SCHEMATIC PART NO. 038-979

RELAY

K301	Reed relay	087-008

LAMPS

#1847 (Meter lamp)	058-008
#1866 (Front panel)	058-014
#1828 (MPX lamp)	058-027
Festoon lamp (Dial glass)	058-032

FRONT PANEL & TRIM

Front panel	044-109
Front panel end caps	018-120
Tuning knob	044-122
Muting control knob	044-372
Mode selector knob	044-372
Stereo filter knob	044-372
Volume control knob	044-372

MOUNTING SYSTEM

Shelf bracket (right)	043-592
Shelf bracket (left)	043-593
Mounting template #100	038-179
Hardware package	043-446

MISCELLANEOUS ITEMS

FM dipole antenna	170-033
Dial glass	044-164
Pointer	043-876
Dial cord (complete)	044-226
Fuseholder	178-001
AC power cord	170-021
Shipping carton	044-238
Owners manual	038-912
Plastic feet	017-041
Push terminal (antenna)	074-033
Audio cable (6')	170-015